folio
UNIVERSITY OF ALBERTA

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Researcher rises to grand challenge of fighting TB

Michael Brown

Although treating tuberculosis is a long and arduous task, half the battle in the fight against the sometimes lethal infection is figuring out whether someone has it. Diagnosis of active TB normally relies on X-rays, as well as microscopic examination and microbiological culture of body fluids.

Unfortunately, in developing countries where the disease is reaching epidemic proportions, this sort of in-depth exploration is simply not an option.

A cheap and easy-to-administer solution is on the horizon thanks to University of Alberta chemistry professor Julianne Gibbs-Davis, who recently won a $100,000 Canadian Rising Stars in Global Health Grand Challenges Canada grant to help push her innovation along.

Gibbs-Davis, who has been a professor at the U of A since 2008, began her research career wanting to use her nanotechnology background to dream of ways of making chemical systems that mirror the complexity of nature, like the ability to self-replicate.

She explains the original aim was to make a system in which natural DNA could trigger replication using a combination of natural and unnatural DNA building blocks. If it worked, it would be a simple way to detect a unique DNA sequence associated with a host of infectious bacteria like TB and malaria.

"Our goal is to use our DNA replication strategy to detect these diseases with a level of accuracy that typically is only found using tests located in well-equipped hospitals," said Gibbs-Davis. "With results provided at the point of care, patients should be able to be treated correctly and more quickly, which should alleviate the patient's suffering and help minimize the spread of infection."

In the last year, Gibbs-Davis says, her team has made bigger

Continued on page 3

Campus transportation slowed to a hop

John Ulan

Seemingly continuous snowfall through December keeps more than the U of A maintenance crews hopping.

Post-secondary leaders to seek ways of working together

Michael Brown

Top administrators from the University of Alberta and educators from the leading post-secondary institutions in the capital region have agreed in principle to actively pursue collaborative initiatives in an effort to strengthen the impact their respective institutions have on the community and the province.

President Indira Samarasekera and U of A board chair Doug Goss met recently with their counterparts at MacEwan University, Northern Alberta Institute of Technology and Norquest College to explore opportunities to align ideals and resources to the benefit of each institution, the city of Edmonton and the province.

Despite each institution having different mandates from the province, Goss says, several overarching themes emerged from the talks—specifically, that Edmonton be seen as a vibrant, productive and innovative city; that post-secondary educators are seen as vital contributors to the city's successes; and that Edmonton be seen as an education destination.

"The U of A is the flagship institution in the province of Alberta, and it is important for the university to lead initiatives like this," said Goss. "Part of building a great city and province is building up other institutions and keeping them strong. When we're all strong, we all benefit."

Administrators agreed that there are practical and mutually beneficial ways in which to collaborate as institutions to take advantage of individual strengths. These opportunities can range from administrative and support services to risk management and crisis communications.

Supplied

Doug Goss

"It is important that we affirm to each other that each of these institutions plays an important role in higher education, and that we acknowledge that importance to our constituents," said Goss. "The bottom line going forward is whenever we can work together to make each other's lives better on a whole host of things, we're going to do that."

Goss says conversations are already underway between the institutions—and are beginning to bear fruit.

"We have a lot of talent at the University of Alberta," he said. "If we can help each other out and say, 'Here's what worked for us,' and that saves another institution some time and money, why wouldn't we do that?"

folio

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UNIVERSITY OF ALBERTA

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German ambassador looks at flip side of partnership

Michael Davies-Venn

Ambassador Werner Wnendt, Germany's new envoy to Canada, visited the U of A Dec. 5, where he heard about some of the initiatives the university and his country are engaged in. He says the list of collaborations is impressive.

"From the presentations that were made, it's obvious that there's not only a close co-operation within the Helmholtz-Alberta Initiative (HAI), but there are all kinds of activities going on. This intensity and quality of relationship is really a model for other universities."

Britta Baron, the U of A's associate vice-president (international) and vice-provost, was at the event, which brought together students, faculty and staff with connections to Germany. She says it comes as little surprise that a new U of A pilot program that fosters student mobility is being tried in Germany. She says the new University of Alberta International initiative, e-3 Berlin, is part of an effort to provide more U of A students with a study-abroad experience.

"We're actively working on strengthening our education abroad in Germany," said Baron. "But we hope to bring this module, which is flexible for students, to other countries as well."

The HAI, German-Canadian Centre for Innovation and Research, and German Academic International Network are among flagship initiatives through which the U of A maintains a strong connection with Germany.

Lorne Babiuk, U of A vice-president (research), chaired the event, which he called an opportunity to bring together students, faculty and staff who help build the university's relationship with Germany.

"Many of you have been instrumental in helping establish, maintain and nurture those relationships," he said, noting the German embassy has been supportive of this burgeoning relationship.

Babiuk added that although some of the initiatives that connect the university with Germany are situated at the U of A, they benefit the entire country: "We're really privileged to have that nucleus of activity here."


Richard Siemens

Lorne Babiuk (left) welcomes Werner Wnendt to the U of A during a reception Dec. 5.

Stefan Scherer, managing director of HAI, said the program, which started in 2009 and now has more than 100 students and researchers involved, is being developed beyond its initial scope.

"We started with a focus on energy and environment, and within a few years, other interests have sparked," said Scherer.

"We're now working with Helmholtz in other areas, among them health, such as infectious and neurodegenerative diseases, and a program to develop ecosystem monitoring and resource informatics."

Some of these issues are also being addressed through the Worldwide Universities Network, within which the U of A is active in helping to address global challenges.

Wnendt says the outcome of the university's engagements with Germany will benefit other parts of the world.

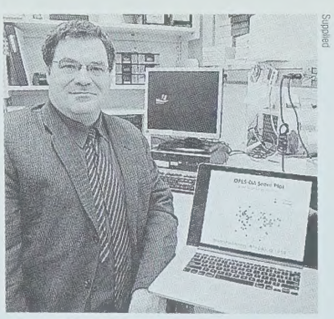
"There's a vast range of issues which are considered to be global in nature—global challenges, not only to Canada and Germany, but to all countries," he said.

Buying time in cancer fight

Phoebe Day

Pancreatic cancer has a dismal prognosis, especially if it is diagnosed late. But a new non-invasive way of detecting the disease early offers the potential for more treatment options, say Edmonton researchers.

The scientific team, led by Department of Oncology researcher Michael Sawyer, found that by using metabolomics—the unique chemical fingerprints that cellular processes leave behind—to detect pancreatic cancer at an early stage may facilitate the discovery of novel pancreatic cancer biomarkers. The article was published in the *Annals of Surgical Oncology*.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Michael Sawyer led a research team that discovered a new method for early detection of pancreatic cancer.

"We were surprised at how good these results were," said Sawyer, an Alberta Health Services medical oncologist at the Cross Cancer Institute. "Pancreatic cancer is incredibly hard to detect, and symptoms are very vague. This method did a good job of discriminating between people with cancer and those without."

The team compared urine samples of pancreatic ductal adenocarcinoma patients with those of a healthy population, as well as those of patients with benign pancreatic disease, and found a "clear distinction" among the profiles—suggesting that metabolomic approaches may be able to help detect the disease earlier.

Currently, the median survival of PDAC is 12 months, and the only potential curative treatment is surgery. However, if the disease isn't detected early, surgery no longer remains an option. Up to 80 per cent of patients present at an advanced, incurable stage.

"This study is important because if pancreatic cancer is discovered earlier, then maybe something can be done," said Sawyer, whose team, which completed a followup study with similar results, includes researchers from the University of Calgary.

Urinary metabolomics can define unique tumour-related signatures, opening up new avenues for non-invasive screening of high-risk populations, say the research team. Specific pancreatic cancer metabolomic signatures could also uncover new therapies when surgery fails.

The study was funded by the Alberta Cancer Foundation and its many donors, including one whose life has been heavily affected by pancreatic cancer. She lost her husband, father-in-law and cousin to the disease.

"My husband had six siblings, and we have four children and two grandsons," said Barb. "I donate specifically to pancreatic research at the Cross Cancer Institute because I am hoping that it will help so that my family and others will not have to go through what we have in the past."

Myka Osinchuk, CEO of the Alberta Cancer Foundation, said, "We are honoured that Barb donated to us to fund this important research. It is exciting to see donor dollars have a direct impact on outcomes that are important to Albertans—in this case, earlier detection and improved treatment options."

Research chair says province sitting on biotech 'gold mine'

Bryan Alary

A University of Alberta researcher and one of the world's leading virologists says the province is sitting on a biotech "gold mine" that could create new jobs for Albertans and save lives in the process.

Michael Houghton, Canada Excellence Research Chair in Virology in the Faculty of Medicine & Dentistry, not only discovered hepatitis C, but also developed the first vaccine for a virus that is more virulent than HIV, with 170 million people infected worldwide. It's the kind of translational research that's possible at the Li Ka Shing Institute of Virology at the U of A, he says, and it can also mean big business for Alberta.

Houghton was recruited to the U of A in 2010 with 30 years' experience in San Francisco's biotech industry. He spent most of that time at Chiron, a startup blood diagnostics company that, before its $14-billion sale to Novartis, saw annual revenues of $2 billion and employed 6,000 people worldwide.

> "What we've done at the Li Ka Shing Institute in the last few years would be the envy of a world-class biotech company."
>
> Michael Houghton

"We can do that here. With the quality of research that our institute and our faculties are doing here, we can create a biotech industry for Alberta," says Houghton. "What we've done at the Li Ka Shing Institute in the last few years would be the envy of a world-class biotech company."

The problem, Houghton says, is the work isn't cheap. Though the provincial government has invested considerably in facilities such as the Li Ka Shing Institute and its research teams, getting a biotech industry off the ground means expensive clinical trials. If government had a role in developing those trials, it would have a financial stake once vaccines and drugs are commercialized.

"If you do the clinical trials and it works, then you've got a product. And then you can get companies to actually develop it and deliver it to the population. That actually makes money for everybody," Houghton says. "Everyone will be a winner, especially patients—Alberta's sitting on a gold mine."

At the U of A, Houghton has been trying to improve the hepatitis C vaccine, boosting its yield and making it easier to produce in mass quantities. In 2015, his team plans to test this new version in human volunteers and later in intravenous drug users—the group at highest risk of hep C infection. If that works, the next step would be licensing the vaccine in Alberta and countries around the world.

Michael Houghton

"There are 100,000 IV drug users in Canada. If we can immunize them and protect them from hep C, I think that will be a useful contribution to the work we're doing here."

Hepatitis C is also a significant problem in China, which for decades did not use disposable needles in its health-care system. Houghton estimates about 30 million Chinese are infected with hepatitis C, and even more are infected with hepatitis B.

Houghton is using new screening technology to develop newer, more affordable drugs that would help countries like China deal with a "ticking time bomb." He's also working on a clinical diagnostic for autoimmune hepatitis.

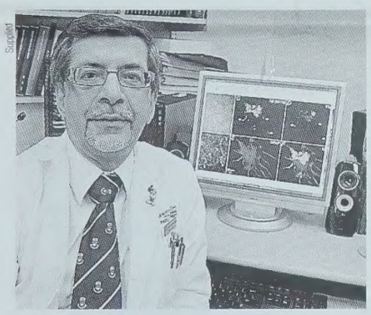
Houghton has nothing but praise for the scientists and clinicians he's worked with since arriving at the U of A, a group that includes Lorne Tyrrell and David Evans. What makes the Li Ka Shing Institute of Virology great, he adds, is its mandate to go beyond pioneering research and translate results to patients.

"The work on the hep C vaccine, I could have just published the paper and let others develop the vaccine but I really want to get the vaccine made in Alberta and protect Albertans and other Canadians. To me, the job is only half done if you only do the research. You've got to deliver it."

Researchers give failed diabetes drug second chance in fight against Alzheimer's disease

Raquel Maurier

Medical researchers have discovered that a drug intended for diabetes appears to restore memory in brain cells affected by Alzheimer's disease.



Jack Jhamandas

Jack Jhamandas, a researcher with the Faculty of Medicine & Dentistry, is the principal investigator with the team whose research results were recently published in the peer-reviewed publication *The Journal of Neuroscience*. He works in the Division of Neurology.

The team took brain tissue from animal models with Alzheimer's disease and tested the tissue in the lab, looking specifically at the cells' memory capacity. When brain cells are shocked by a barrage of electrical impulses, the cells "remember" the experience; this is a typical way to test or measure memory in the lab setting.

Amyloid protein, which is found in abnormally large amounts in the memory and cognition parts of the brains of Alzheimer's patients, diminishes memory. A sister protein, known as amylin, which comes from the pancreas of diabetic patients, has the same impact on memory cells.

Jhamandas and his team demonstrated last year that a diabetes drug that never made it to market, known as AC253, could block the toxic effects of amyloid protein that lead to brain-cell death.

In the lab, Jhamandas and his teammates, including Ryoichi Kimura, a visiting scientist from Japan, tested the memory of normal brain cells and those with Alzheimer's—both from animal models. When the drug AC253 was given to brain cells with Alzheimer's and the shock memory tests were redone, memory was restored to levels similar to those in normal cells.

"This is very important because it tells us that drugs like this might be able to restore memory, even after Alzheimer's disease may have set in," says Jhamandas.

His team is continuing their research in this area and want to see whether the drug, when given before symptoms appear, can "stop the impairment of behaviour and cognition altogether in animals destined to develop Alzheimer's," says Jhamandas. Their continued research tests will take a least a year to complete.

> "This is very important because it tells us that drugs like this might be able to restore memory, even after Alzheimer's disease may have set in."
>
> Jack Jhamandas

He noted it is difficult for AC253 to cross the brain barrier, so research teams in pharmaceutical companies would need to design a similar drug that can penetrate brain cells more easily. Jhamandas says if the tests are successful, he thinks clinical trials could start within about five years, but he stressed that further testing needs to be done before such trials can occur.

"I think what we discovered may be part of the solution, but I can't say it will be the solution. There is a long list of drugs and approaches that haven't panned out as expected in the fight against Alzheimer's. I don't think one drug or approach will solve Alzheimer's disease because it's a complicated disease, but I am cautiously optimistic about our discovery and its implications."

The Canadian Institutes of Health Research funded the work of Jhamandas and his team.

"An estimated 1,125,000 Canadians will be diagnosed with Alzheimer's over the coming 30 years," said Yves Joanette, scientific director of the CIHR Institute of Aging. "To respond to this growing health-care challenge, CIHR developed the International Collaborative Research Strategy for Alzheimer's Disease. The strategy aims to give Canadians rapid access to the latest approaches to preventing, diagnosing and treating Alzheimer's disease and related dementias. The findings by Dr. Jhamandas could eventually help reduce the personal, social and economic impacts for Alzheimer's disease."

Grand Challenges inquiry becomes a departmental affair

Continued from page 1

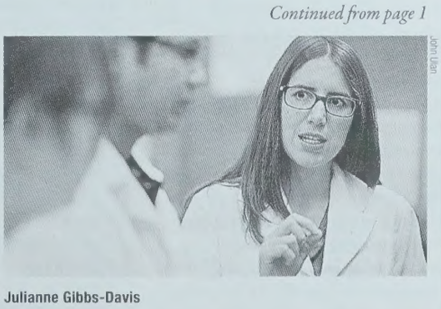
strides than she anticipated, setting the stage for some new benchmarks.

"Our next goal is to make the system robust, so we can send a first-generation, one-pot detection system to our collaborators in Zimbabwe and South Africa," she said. "Our preliminary results are looking very good."

Grand Challenges Canada is a federally funded grant program that brings focus and energy to defining and addressing global health issues. A grand challenge is a specific critical barrier that, if removed, would help solve an important health problem in the developing world, with a high likelihood of global impact through widespread implementation.

The global nature of the infection has drawn Gibbs-Davis into collaborations with researchers in Zimbabwe and South Africa, but has also drawn her closer to colleagues right here at home.

"Three of my colleagues are also working on global health projects funded by Grand Challenges or the Gates Foundation. We are all approaching it in different ways, which broadens my view," she said. One of her colleagues, Ratmir Derda, organized a point-of-care diagnostics conference in Kenya this summer that was also sponsored by Grand Challenges.



Julianne Gibbs-Davis

"That was really eye-opening and has given me a very helpful perspective going forward on this project."

She adds that the U of A has been a tremendous place to start her independent research lab.

"I have all the technical resources I could need in my lab and available throughout the department," she said. "I have great graduate and undergraduate students who are excited and passionate about research."

Grand Challenges

Canadian Rising Stars in Global Health

ROUND 1	
RATMIR DERDA Professor Department of Chemistry	Paper as enabling platform for cell-based assays for basic research and medical diagnostics in resource-limited environments
STEPHANIE YANOW Professor School of Public Health	Revamping an old tool: Point-of-care molecular diagnostics in blood capillary tubes
ROUND 2	
KARIM DAMJI Professor Department of Ophthalmology	Preventing and treating avoidable blindness from glaucoma in sub-Saharan Africa
ABDULLAH SALEH Surgical resident	The Kibera Medical Record Initiative
MICHAEL SERPE Professor Department of Chemistry	Point-of-care technology for the diagnosis of multiple diseases: A solution to the disease over-treatment problem
AMAN ULLAH Professor Department of Agricultural, Food and Nutritional Science	Filters from poultry feathers for removal of arsenic from contaminated drinking water in developing countries

Sexual assault prevention campaign relaunched

Jamie Hanlon

It's a simple message that bears repeating: Don't be that guy. And it's a message that Lise Gotell, chair of women's studies at the University of Alberta, was pleased to be able to deliver.

An award-winning campaign that Gotell was involved in was relaunched Nov. 30 with a new series of posters focusing on the tag line, "It's not sex when...." The Women's Studies Program and the U of A's Sexual Assault Centre are two of nearly a dozen community partners in the Sexual Assault Voices of Edmonton coalition whose innovative campaign has been used by policing and social services agencies worldwide. Gotell is proud of the work the coalition has accomplished, but she says that sexual assault rates remain high across Canadian campuses, and this new proactive campaign stressing communication—and the ability to communicate intentions—is a necessary one.

"People need to be communicative around sex," she said. "That can prevent a lot of harm."

The campaign's target audience is young males between ages 18 and 24. With recent statistics from the Edmonton area showing problematic issues of drinking and sexual assault complaints within that age group, Gotell says taking a different approach to education may be the key to preventing these types of traumatic crimes.

"There's a clear line when it comes to sexual consent, but despite this legal clarity, we know there's a very low level of awareness about what sexual consent means," she said. "Social marketing can help us close this gap."

Gotell, who studies sexual consent within Canadian law, says the country's standard for consent goes beyond the popular "no means no" ideology. Citing a 2011 Supreme Court of Canada decision requiring actual, active consent throughout every phase of sexual activity, Gotell says the message is not getting across to the people whose poor judgment may spell harm and trauma for all. Thus, although Canada may stand out in its work to define and interpret sexual assault, publicizing it needs to take a different approach. And the approach Gotell and her SAVE partners have been using seems to be working.

"Canada is understood to be a leader by feminist reformers in other countries when it comes to sexual assault law," she said. "Our campaign has been a really effective strategy in terms of spreading our message."

Gotell says that what makes the messaging of their campaigns different from the norm is that it refocuses the responsibility to the potential perpetrators of an assault rather than the potential victims. She says the standard behaviour-modification messaging is ineffective and seems to blame the victim for failing to heed the warnings. Gotell says the new campaign's focus is meant to "delegitimize common excuses" for sexual assaults. Further, she says, it broadens the scope of the message to recognize that sexual assault is a problem that transcends sexual orientation.

"The new campaign extends the focus of the message beyond a heterosexual audience," said Gotell. "This new campaign is intentionally provocative. The blunt language and challenging images are meant to draw attention to our core message: sexual contact without ongoing and active consent is sexual assault."

SAVE

Questions key to professor's quest for best practice

Michael Brown

Killam

When Sunita Vohra was a pediatric resident in the mid-1990s, she recalls being asked to prepare for the arrival of a premature baby. Wanting to help but not to be a liability in this life-and-death moment, Vohra went over her training.


Richard Siemens

Sunita Vohra

"When a newborn premature baby needs resuscitation, before you do anything else, even before checking the airways, you have to make sure they are dry. Babies are wet when they're born, and if they're premature, they're small but have a relatively large surface area—being dry becomes more important than anything else because wet babies get cold and have a very poor outcome," said Vohra.

As the moment neared, and the team was going over its plan, Vohra was told the physician on call doesn't like drying, he prefers wrapping.

"I asked, 'What do you mean he doesn't like drying?' and I was told in this institution different pediatricians have different opinions on what is the best thing to do, so you'd better do the thing that your staff person wants."

Vohra says that conversation lingered long after the incident played out, to the point that she set out to find the definitive answer to the question, wrap or dry?

Vohra would eventually take part in a large international trial, which determined that drying keeps premature babies warmer and that separately has been linked with reduced mortality. The decision to clarify the process and determine a best-practices course of action would define a career that seamlessly blends physician, educator and researcher.

"There are so many opportunities to ask and answer things we need to answer," said Vohra, who was awarded a 2012-13 Killam Professorship, which recognizes top U of A scholars based on teaching, research and service to the community. "I want my students to question the things that they do and the things that they see. It is the only way we are going to deliver better care because we are constantly questioning and saying, 'Why do we do it this way?'"

The underlying theme of Vohra's research program is a heavy focus on patient-centred research. "We try to look at things that our patients say are important to them."

This means, in many cases, the use of a clinical trial in which a single patient is the entire trial, often referred to as an N of 1 trial.

"Instead of forcing a person into a particular fit for a research trial, we wrap the research around the patient," said Vohra. "The patient gets to stay as they are with their other conditions and their other therapies, and we try to work with them to see whether an additional therapy is effective for them for whatever condition they're taking it for, so it is highly malleable in a way that a typical randomized-controlled trial is not."

Vohra's team also employs an active surveillance approach, which involves asking and reporting on the safety of a chosen therapy instead of passively waiting for harms to be spontaneously reported. She says research shows that identification of adverse events is improved by 7,000 times with active surveillance.

"We do systematic reviews to see what is already known, and we come to realize pretty quickly that a major barrier in understanding safety is a lack of reporting," she said. "With active surveillance, fewer people have to experience harm before a trend is noticed and someone puts two and two together and says, 'Wait a minute, maybe this isn't as safe as we thought it was.'"

And just as with determining the best starting point for rescuing a premature baby, Vohra—director of the university's Complementary and Alternative Research and Education (CARE) Program for Integrative Health and Healing—pushes her team to spend time looking into questions that are in themselves useful to patients but also trying to refine and develop methods.

"I went to medical school to help people," said Vohra. "As a pediatrician, I can help one patient at a time. As a health researcher, I hope to be able to affect the health of entire groups of people who have a particular condition."

Vohra says her propensity towards wanting to help is compounded by what she describes as incredibly fertile research ground.

"Our team doesn't do our work alone—all the work we do is collaborative and interdisciplinary," she said. "We are in an environment that is very supportive and collaborative, and has so many strengths that make it easy for us to get the support that we need to be able to answer the questions we are interested in."

the open door

Looking back at a year of excellence and leadership

Indira Samarasekera
President and Vice-Chancellor

As this term and 2012 come to a close, I'd like to take the opportunity to wish you the best of the season and to thank you for your hard work, energy and dedication to the University of Alberta. I hope that you will take a well-deserved rest and find joy in family and friends over the holidays.

As I reflect over the many events of the last year, there are a few highlights that come to mind—not only because of the achievements in themselves, which are important, but because of what they represent about our community and the aspirations we hold. I think, for example, of Megan Engel, who recently won a Rhodes Scholarship. Megan exemplifies the talent, ambition and passion of so many of our students who strive to attain academic goals while also pushing their creativity capacities and feeding deeply held beliefs and passions. That our students are able to do this at the U of A is confirmation of the teaching excellence and student engagement I know faculty and staff strive to achieve each day.


Supplied

Indira Samarasekera

Another highlight of 2012 represents aspiration of another kind: the U of A's fight for dodgeball supremacy. It may only be a game, but when you're there in the Butterdome with 5,000 other U of A students, faculty, staff and alumni, it feels like something more. The overwhelming sense is one of connection—to each other and to the great tradition of the green and gold, which measures up to the best in the world.

Community and collaboration doesn't only win dodgeball records. On a more serious note, another highlight of 2012 was the establishment of the new Canada-India centre of excellence in partnership with the universities of Toronto and British Columbia. Our involvement in the India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Transformation and Sustainability gives us the opportunity to forge new national and international partnerships, and in collaboration with them, bring U of A research to bear on the pressing global challenge of ensuring that communities have access to safe drinking water. Being part of such initiatives is one way in which we are fulfilling the U of A's vision of global citizenship and leadership.

I could draw on many, many more examples to illustrate my point: that the faculty, staff and students of the U of A continue to fulfil our aspirations for excellence and leadership. Thank you again for all that you do to sustain and strengthen the U of A. Thank you for your commitment to our students and the work that you do to create learning environments that allow students to succeed and flourish. Happy Holidays, and for those who celebrate it, Merry Christmas!

Using nanotechnology to turn the tables on CO2 emissions

Ryan Heise

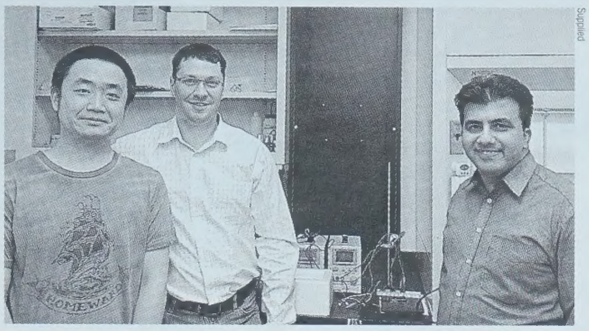
A unique "two-birds-with-one-stone" process being developed by University of Alberta researchers could have a big impact on reducing carbon dioxide levels and using renewable energy efficiently.

Electrical and computer engineering professor Karthik Shankar and chemical and materials engineering professor Greg Dechaine, along with post-doctoral fellow Albert Zhang, are addressing harvesting renewable sunlight and mitigating captured carbon through a single process. Called CO2 photoreduction, the process turns carbon dioxide back into usable fuels.

"When you burn methane, you get CO2 and water. What we're doing is essentially running this process in reverse and adding energy," Shankar said.

CO2 photoreduction seems simple in theory: fill a chamber with CO2, water and a catalyst, feed it sunlight, and let the reaction happen. The result is methane and other hydrocarbons that can be stored as fuel. This process has been known for some time but the efficiencies are quite low. The group's new method has significantly increased the output by focusing on the catalyst used in the reaction.

As Dechaine explained, previous methods of CO2 photoreduction often treated the catalyst as an afterthought, instead focusing on simply capturing the most amount of light. But their method combines the light-gathering system with the catalyst using nanomaterials.



Supplied

(From left) Albert Zhang, Greg Dechaine and Karthik Shankar

> "There's always going to be art involved in your science, and you never know how the art is going to turn out."
>
> Greg Dechaine

"We're using something called one-dimensional photonic crystals coated with a bimetallic catalyst," Shankar said. "This material absorbs light better, but we have also notched the structure to increase the surface area. This allows us to use more catalyst. It's a very clever use of nano-devices."

Notching the nanotubes was an idea of Zhang's, and also a bit of a shot in the dark. But as Dechaine explained, trying new things without any expectations is a big part of research.

"There's always going to be art involved in your science, and you never know how the art is going to turn out," he said. "Notching the structure proved to be that bit of art we needed."

The group is now working on designing experiments to continue understanding how the nanomaterial could be further exploited to improve efficiencies.

"We need a lot of fundamental research," Shankar said. "Once we clarify the mechanism involved in our process, we should be able to move forward more quickly."

Dechaine said the group has theories on how to get into the area of improving efficiencies 100 times over their current process, but they are still a ways away from having their CO2 photoreduction process venture into industry.

"Just doing some quick calculations, I figure we need a 20-fold improvement in efficiencies, then at least one more 20-fold to make it viable," Dechaine said.

Still, there's plenty of interest in the research. With CO2 emissions a constant environmental concern, and a political focus on carbon capture from significant emitters in Alberta and elsewhere, the proposition of being able to transform CO2 back into reusable fuels using renewable sunlight is an exciting prospect.

There are also other uses for the improved process. For instance, Shankar suggested the nanomaterial could be adapted for water remediation in the oilsands.

"It could theoretically be used for water photo-oxidation in tailings ponds. Instead of targeting CO2, we could target other contaminants."

Prosthetic limb researcher wins Banting Award

Bryan Alary

A University of Alberta researcher's efforts to improve the lives of military personnel, veterans and amputees at home and abroad have been recognized with one of the Canadian Forces' highest honours for health research.

Jacqueline Hebert, an associate professor in the Faculty of Medicine & Dentistry and associate research chair in clinical rehabilitation in the Faculty of Rehabilitation Medicine, is the recipient of the 2012 Major Sir Frederick Banting Award for Military Health Research. The honour is given to the Canadian whose research presentation at the Canadian Military and Veteran Health Research Forum is "deemed to be of the greatest overall value to military health" as judged by Canada's Surgeon General, Brig.-Gen. Jean-Robert Bernier, who presented the award Nov. 28.

The award recognized Hebert's work in advancing prosthetic limb development, both at the U of A and through her role as medical lead of the Adult Amputee Program at the Glenrose Rehabilitation Hospital. Her team has pioneered targeted sensory reinnervation surgery—a technique and sensory feedback system that aims to give an amputee a degree of sensation in their prosthetic limb.

"What we're trying to do, basically, is make bionic limbs that can feel," Hebert explained, noting that despite recent technological advances, upper-limb prostheses are non-intuitive, hard to control and lacking in sensory feedback.

"Not only will they be able to use their prosthesis to feel things, but they can also start to reintegrate the device into their body image and feel like it's a piece of them, not just a mechanical device that's attached to them."

Hebert's team has performed the procedure on one patient and, with the aid of a robotic arm, demonstrated his ability to perform functional tasks while blindfolded and wearing headphones. The next step involves performing the technique on additional subjects and integrating sensory feedback into a prosthetic device, which will happen over the next four years in collaboration with researchers in Ohio.

Supplied

Jacqueline Hebert receives the 2012 Major Sir Frederick Banting Award for Military Health Research from Brig.-Gen. Jean-Robert Bernier, Canada's Surgeon General.

Hebert said her research and recognition like the Banting award would not have been possible without the collaboration and support of the Division of Physical Medicine and Rehabilitation, the Department of Mechanical Engineering, the Glenrose, and her research chair position, which gave her the time to actually pursue the work.

"Without those areas of support across the university and the Glenrose, this would have been extremely difficult to accomplish," she said. "These projects can only get done with interdisciplinary collaboration; they can't be done in silos."

Sponsored by True Patriot Love, the Banting award is named after the renowned Canadian physician and researcher who received the Nobel Prize in medicine for his co-discovery of insulin.

TLEF

Physics professor helps students make quantum research leap

Michael Brown

In the earliest part of this millennium, physics professor Frank Marsiglio began dabbling with introducing his own research into the classroom. In one of his graduate classes, he assigned a homework problem based on some recent research work in his field—superconductivity—that involved a new calculation.

A student and a post-doctoral fellow who was auditing the course took up the challenge, solved the homework problem, and extended the solution to the point where the three of them co-wrote a paper and had it published.

Supplied

Frank Marsiglio

Marsiglio says he was sold. From that point on, inquiry-based learning became a staple in his classrooms.

Several years later, Marsiglio started teaching the third- and fourth-year quantum mechanics courses in physics when he came across a disconnect between the long-established undergraduate curriculum—which uses a formulation that is amenable to analytical solution—and the numerical quantum mechanics solutions used in research that employs high-level software packages.

Marsiglio says introducing computer-based problems seemed like a win-win situation.

"First, the students were learning material that was much more aligned with research practice, and second, they were being required to learn a skill set that would serve them well in the future, even if their career path progressed beyond the scope of the degree they were earning," he said. "Furthermore, students in physics are required to learn a lot of mathematics, which can be frustrating for some, and can serve to dampen their enthusiasm for physics."

To help with the transformation, Marsiglio received a $39,500 University of Alberta Teaching and Learning Enhancement Fund grant, which he used to hire summer students to pilot programs for implementing numerical-based problem solving in the upper-level undergraduate quantum mechanics classes.

All told, four papers resulted from the work. Three were accepted in journals suited for pedagogical topics in physics, and the fourth turned out to be sufficiently research-oriented that it will be published in a research-intensive letter journal.

From a research perspective, Marsiglio says the TLEF provided an invaluable research experience for the summer students, which will be shared with future cohorts of students in quantum mechanics. For him, being able to introduce undergraduate students to quantum mechanics in a research setting has invigorated his classroom.

"The extra challenge of formulating and solving numerical problems—problems that, to my knowledge, no one has ever solved before—reappears in my lectures through the enthusiasm one generally gets when one solves problems in research," he said. "One can't help but be enthusiastic if one has just figured out how to do something the night before."

Marsiglio says he feels he is now serving the needs of all the students in the classroom—those who will continue in a research environment, and those who will not, but will nevertheless likely apply their acquired skills and training throughout their career, whatever that turns out to be.

"The TLEF has provided a golden opportunity for me, along with a number of undergraduates, to engage in activities that will hopefully enhance the learning experience for advanced undergraduates in quantum mechanics," he said. "Don't get me wrong—I still insist that students learn about Laguerre polynomials, and even confluent hypergeometric functions—but I balance the sophisticated mathematics with numerical problems."

Building better barley to beat the heat

Bev Betkowski

As one of the top 10 barley producers in the world, Canada faces a problem of adapting to the new normal of a warmer, drier climate.

> "[Grad students'] work helps power this process of discovery."
>
> Anthony Anyia

The 2012 growing season was considered an average year on the Canadian Prairies, "but we still had a summer water deficit, and it is that type of condition we are trying to work with," said Scott Chang, a professor of soil science in the Department of Renewable Resources.

Chang began teaming up with fellow crop scientist Anthony Anyia of Alberta Innovates – Technology Futures in 2006, following a severe drought in 2002 that dropped average crop yield in Alberta by about half. They are exploring the genetic makeup of barley and how the grain crop—a Canadian staple used for beer malt and animal feed—can be made more efficient in its water use and more productive. One of their latest studies, published in the journal *Theoretical and Applied Genetics*, explores how to increase yield in barley crops while using less water.

Seventy per cent of barley grown in Canada is used for animal feed, and it is the third-largest crop grown here, following canola and wheat.

"Our research gives a way to get the most out of what water there is in a dry environment," said Anyia.

The latest study was led by lead author Jing Chen, a former PhD student in Chang and Anyia's lab. The group planted and harvested two common types of barley plants in test plots around Alberta, then analyzed the plants for genetic traits and other factors such as height, days to maturity and yield.

By studying the carbon isotope compositions of barley plants and their relationship with water-use efficiency, the researchers developed tools that plant breeders can use to improve selection efficiency for more water-efficient varieties. The latest findings stem from an ongoing collaboration that is ultimately aimed at bringing farmers a more stable breed of the plant that has less reliance on water and is less vulnerable to climate change.

Besides yielding results for growers, the collaborative research between Chang and Anyia is also bountiful for students who help conduct the work, the pair noted.

"So far, we've had two graduate students and a post-doctoral student on our team, which has expanded scientific knowledge and contributed to the ultimate goal of better crop performance in the face of a drier climate," said Anyia. "Their work helps power this process of discovery."

The collaboration between the U of A and Alberta Innovates – Technology Futures benefited the research team and the work itself, Chang noted.

"Working jointly gives our graduate students access to researchers with complementary expertise, as well as lab and field facilities off campus."

The study was funded and supported by the Natural Sciences and Engineering Research Council of Canada, the University of Alberta, the Alberta Agricultural Research Institute, the Alberta Crop Industry Development Fund, the Alberta Barley Commission and the Brewing and Malting Barley Research Institute.

John Ulan

Scott Chang (left) and Anthony Anyia have teamed up to explore ways to increase yield in barley crops while using less water.

Tracing humanity's ancestry out of Africa

Jamie Hanlon

New research by a University of Alberta archeologist may lead to a rethinking of how, when and from where our ancestors left Africa.

Anthropology chair Pamela Willoughby's explorations in the Iringa region of southern Tanzania yielded fossils and other evidence that records the beginnings of our own species, *Homo sapiens*.

Her research, recently published in the journal *Quaternary International*, may be key to answering questions about early human occupation and the migration out of Africa about 60,000 to 50,000 years ago that led to modern humans colonizing the globe.

From two sites, Mlambalasi and nearby Magubike, she and members of her team, the Iringa Region Archaeological Project, uncovered artifacts that outline continuous human occupation between modern times and as far back as 300,000 years ago, including during a late Ice Age period when a near extinction-level event, or "genetic bottleneck," likely occurred.

"The idea that you have such ancient human occupation preserved in some of these places is pretty remarkable," she said.

Willoughby says one of the fascinating things about Magubike is the presence of a large rock shelter with an intact overhanging roof. The excavations yielded unprecedented ancient artifacts and fossils from under this roof. Samples from the site date from the earliest stages of the middle Stone Age to the Iron Age. The earlier deposits include human teeth and artifacts such as animal bones, shells and thousands of flaked stone tools. The Iron Age finds can be dated using radiocarbon, but the older deposits must go through more specialized processes, such as electron spin resonance, to determine their age. Other parts of the Magubike rock shelter, excavated in 2006 and 2008, include occupations from after the middle Stone Age. Taken together, this information could be crucial to tracking the inhabitants' evolutionary development.

"What's important about the whole sequence is that we may have a continuous record of human occupation," said Willoughby. "If we do—and we can prove it through these special dating techniques—then we have a place people lived in over the bottleneck."

The team made similar findings at Mlambalasi, about 20 kilometres from Magubike. Among the findings at this site was a fragmentary human skeleton that probably dates to the late Pleistocene Ice Age—after the out-of-Africa expansion but at the end of the bottleneck period. The bottleneck theory explains what geneticists have found by studying the mitochondrial DNA of living people—that all non-Africans are descended from one lineage of people who left Africa about 50,000 years ago.

Further testing will determine whether these findings point to a clearer link to our African ancestors—a find Willoughby says could put that region of Tanzania on many archeologists' radar.

John Ulan

Pamela Willoughby found evidence in Tanzania of human occupation that dates back 300,000 years.

"It was only about 20 years ago that people recognized that modern *Homo sapiens* actually had an African ancestry, and everyone was focused on looking at early *Homo sapiens* in Europe who appeared around 40,000 years ago," she said. "But we now know that as far as back as around 200,000 years ago, Africa was inhabited by people who were already physically exactly like us today or really close to being the same as us. All of a sudden, it's not Europe in this time period that's really important, it's Africa."

Along with its scientific significance, Willoughby's work may be a linchpin to potential economic growth for the region. Since 2005, when a local cultural officer showed her the sites, she has been sharing information about her research with local citizens, schools and government—opening up opportunities for more research and co-operation. She keeps the region informed of the team's findings through posters distributed around Iringa, and has asked for and accepted assistance from local scholars. Now the community is also looking for her help in establishing the historic sites as a tourist attraction.

Willoughby says she feels fortunate to have support from the Tanzanian people. She tells people it is a shared history she is uncovering, something she is honoured to be able to do. "They're telling me, 'You're putting Iringa on the map,'" she said. "As long as they keep letting me work there, and keep letting the people working with me work there, we'll be happy."

Willoughby's research in Tanzania is funded by the Social Sciences and Humanities Research Council of Canada, the Wenner-Gren Foundation and various funds at the University of Alberta.

World music researcher honoured for breaking down sound barriers

Michael Davies-Venn

A University of Alberta music researcher has been made an honorary member of the U.S.-based Society of Ethnomusicology for her outstanding contributions to the field—a nod she says is less about her and more a statement on the quality of the university's ethnomusicology education.

"The society is the most dominant and influential society of its kind in the world of ethnomusicology," said Regula Burckhardt Qureshi, professor emerita in the Department of Music. "This means our study is reaching beyond western music and musical notes."

Relating the world's sounds with the social conditions of their producers is a central contribution Qureshi began making during a research trip to India almost 50 years ago.

"While there, I found out that the people who had the greatest mastery in Sufi music were actually very poor and marginalized, and that disturbed me," Qureshi recalled. "When I returned to Canada, I thought, 'What am I doing studying this music when these people have almost nothing to eat?' Yet they shared an ocean of musical knowledge with me."

John Ulan

Regula Burckhardt Qureshi demonstrates how to play the sarangi.

She channelled her compassion into her doctoral dissertation, *Sufi Music of India and Pakistan: Sound Context and Meaning in Qawwali,* which was eventually published in 1986 and stands today as a kind of field manual for ethnomusicologists.

"The way we study had to be different—we had to be collaborative and accommodate the social lives of the people from whom we learn," said Qureshi. "And not just learn their music but also what's important to them, so we could contribute to the lives of people. That change has affected ethnomusicology quite a bit."

That trip to India also marked the beginning of cultural change that Qureshi instigated. While visiting a music college in Lucknow, India, the young professional cellist inquired about different instruments she could learn. At first, she was shown the sitar.

"I said, 'I can't play that,'" she recalled. "But I saw somebody in the corner who was playing an upright instrument, kind of like a mini cello, and he was playing it with a bow. I said, 'That's the instrument I want to learn.'"

She had picked the sarangi, a beautiful 18th-century stringed instrument said to approximate the human voice, but with an unflattering past. Qureshi soon learned the sarangi was ill reputed because it was the typical accompaniment to courtesans singing and dancing in salons for the pleasure of wealthy men.

"It just had a bad name, considered immoral and ostracized," she said. "I knew it was beautiful and I was going to play it, period."

She says puzzlement ensued at this foreigner who went for lessons at the home of her sarangi teacher. She was the first woman, the society notes, to master the instrument. And in so doing, the citation observes, Qureshi "paved the way for other women in South Asia and elsewhere to enter a realm that had been previously gender restricted."

She returned from India knowing music is central to South Asian culture, and has since been strengthening that bond. In recognizing Qureshi's contributions—from organizing music evenings in her home for Edmonton's South Asian community to performing and teaching—the society referred to her as the most illustrious ethnomusicologist in Canada.

At the U of A, Qureshi would go on to create the Canadian Centre for Ethnomusicology, where she is still the director and, according to the citation, has built "one of the country's best graduate programs in ethnomusicology."

"The university now is doing all the wonderful things that make it possible for people like me to connect our work, in a very productive way, with India," said Qureshi.

University honoured for human-rights leadership

Michael Davies-Venn

The University of Alberta has been recognized by a community stalwart working to uphold principles in the Universal Declaration of Human Rights in Edmonton. On Dec. 10, the John Humphrey Centre for Peace and Human Rights celebrated the U of A among other organizations, groups and individuals working to make the city a better place.

Before presenting the award to Phyllis Clark, vice-president (finance and administration), Leah McRorie, awards committee member, said it recognizes a business or public institution that has demonstrated a commitment to excellence in corporate social responsibility and promulgating human rights.

"In 2009, the U of A realigned its delivery model for human-rights services, and as a result, increased the volume and effectiveness of its human-rights advisory and education services. They've launched training and education throughout campus, as well as awareness campaigns that are causing a ripple," she said. "I'm honoured this year to announce the winner of the award is the University of Alberta's Office of Safe Disclosure and Human Rights."

Premier Alison Redford gave the keynote address at the centre's gala at the Sutton Place Hotel. She observed that the day marked the 64th anniversary of the U.N. Declaration of Human Rights and the 40th anniversary of the Alberta Bill of Rights and the Individual Rights Protection Act. The premier said protecting existing freedoms is an unending and critically important task.

"I've seen how the denial of human rights anywhere in the world, even here, leads to oppressive societies that are marked by corruption, violence and suffering," Redford says. "And I've also seen how the affirmation of human rights brings hope to the most hard-pressed of people. The recognition and protection of human rights is what enables everyone to live as they please and to participate fully in the economic, cultural and social life in the community that they live in."

An example of that continuing effort to protect human rights on U of A campuses is the newly updated Discrimination, Harassment and Duty to Accommodate policy, which Clark says is modern.

"The policy is the best of what the university offers in a sense of leading the way. And having that kind of standard is the best of the university," she says.

But for a university that attracts people from all over the world, simply creating policies isn't enough. Wade King, advisor with the Office of Safe Disclosure and Human Rights, says his office takes things a step further—an effort he says the award recognizes.

John Ulan

Phyllis Clark (left) receives the Human Rights Award from the John Humphrey Centre for Peace and Human Rights in recognition of the U of A's efforts to promote human rights on campus and in the Edmonton community.

"At the base level we have policies and legislation that we need to adhere to, but it speaks more to the culture and climate at the university. We have a strong community of individuals who are very interested in human rights; they don't see the bare minimum as acceptable," he says. "We're not the kind of organization that just puts a policy on the wall and walks away."

The university also extends beyond its campuses into the community to join others working to improve quality of life. The premier noted that kind of work makes a big difference.

"I've seen time and time again how the most basic improvements in people's lives start with respect for human rights. Support for human rights is one of the simplest ways to choose the way forward in a community," Redford said.

King says the university works with many partners along that path. For instance, he says the university's Institute for Sexual Minority Studies and Services helps guide the community toward best practices and resources.

"The university's institute not only serves the gay, lesbian, bisexual and transgender community on campus, but it specifically has community connection capacity; they provide services in addition to just an academic endeavour," King said. "The university is not only engaged in research but also in service delivery, best practice research and advice—and in many ways, in being a community leader."

Are You a Winner?

Congratulations to Bob Barton, who won a copy of *In Case of Fire: Please Remain Calm Then Slowly Rebuild Your Life*—the riveting tale of how burn victim Spencer Beach rebuilt his life—as part of Folio's Nov. 30 "Are You a Winner?" contest. Barton identified the location of last week's photo as the Van Vliet Centre's East Pool. Up for grabs this week is your last chance at a stocking-stuffer hall of fame inductee—a Butterdome butter dish. To win, identify where the picture was taken and email your answer to folio@ualberta.ca by noon on Monday, Dec. 24, and you will be entered into the draw.

John Ulan

Soil scientist honoured for fertile 25-year research career

Bev Betkowski

William Shotyk was a city kid when his dad bought a small farm near the rustic village of Elmvale, Ont., in 1972. It was a move that changed the youngster's life, launching a career in soil science that has earned the University of Alberta researcher a prestigious European award.

Shotyk, professor and Bocock Chair in Agriculture and the Environment in the Faculty of Agricultural, Life and Environmental Sciences, has been awarded the Philippe Duchaufour Medal by the European Geosciences Union.

Given to one scientist each year by the Soil System Sciences Division of the European Geosciences Union, the award—one of the world's most prestigious—honours distinguished service to soil science.

Shotyk, who receives his award next spring in Vienna, Austria, is "over the moon" about the distinguished recognition of his life's work. "To have an outcome like this is really awesome," he said.

The awards announcement from the European Geosciences Union describes Shotyk as "the purest example of what a scientist should be, curious by nature and always devoted to tackle individual pieces of science with the aim to solve the wider and intricate puzzle of soil system sciences."

The award pays tribute to Shotyk's 25-year career devoted to studying the environmental effects of heavy metal pollution in soils, and was given in recognition of his numerous studies (185 publications), academic papers (140 in refereed journals), book chapters, and more than 60 invited research presentations and public lectures, as well as his work with documentary filmmakers.

William Shotyk, professor and Bocock Chair in Agriculture and the Environment, was honoured by the European Geosciences Union for his distinguished 25-year career as a prolific researcher, an international collaborator and a tireless advocate for the environment.

In its announcement, the European Geosciences Union praised Shotyk's dynamic collaboration with colleagues from across Europe, the United States and Canada, his work on peat bog archives and his "tireless efforts in environmental projects," including the establishment of the Elmvale Foundation, a registered charity for environmental education, and the Elmvale Water Festival. Both initiatives are based on the original farmland purchased by his father, and are dedicated to awareness and preservation of water quality. Also on the property, Shotyk has since established the Elmvale Groundwater Observatory, to better understand how groundwater is filtered by soil and to develop improved methods of testing water for trace minerals.

Shotyk joined the U of A in 2011 as the inaugural Bocock Chair established in the Faculty of Agricultural, Life and Environmental Sciences. The internationally renowned scientist plans to develop a world-class facility—which he affectionately dubs the "SWAMP lab"—at the U of A, devoted to agricultural and environmental research and teaching, with a focus on chemical transformations at the interfaces among soils, water, air, manures and plants.

Excited about his current work, Shotyk is grateful for a fertile research environment that flourishes at the U of A.

"The university couldn't be more supportive, especially within ALES. Our faculty is like a family, with a collegial atmosphere, and it's a receptive environment, open to new ideas."

A passion for soil, water and plant science took root back on the farm in Elmvale, where Shotyk started with a small garden, and where he has since planted more than 25,000 trees, with the help of family and friends.

"It was my first introduction to soil. I was fascinated that you could put seeds into the earth and before you knew it, you were eating tomatoes and cantaloupes. And of course, the soil and the water are key to that."

Shotyk's continuing goal through his work is to find ways to use soil sustainably, whether it is being put to use by industry, agriculture or forestry.

"Soil is the thin skin of the Earth that is critical for life on this planet."

Staffer gives an education on loyalty

staff spotlight

Michael Brown

If administrators in the Faculty of Education ever needs a testimonial on the joys of working in the Department of Educational Psychology, they need not look any further than Joyce Maycher's resumé.

Supplied

Joyce Maycher

The administrative assistant's working life at the University of Alberta dates back nearly 35 years—all of it with the department.

"I love the people I've worked with—I've had five amazing chairs through the years, and four APOs, and I've had friendships from the beginning right through to today," said Maycher, a 2012 University of Alberta Support Staff Recognition Award winner.

"It's kind of been like my home away from home. I feel like the department has given me a lot, so I think I have given a lot back."

Maycher began her career at the U of A as the department's receptionist before moving into her current role, which goes far beyond looking after the financials. She says she is responsible for helping to acclimatize new academic staff to their surroundings, helping graduate students around the office and pitching in with organizing office events.

Helping out where she can has made Maycher a popular mainstay in an educational psychology department that has a history of long service.

"Three years ago, the girls I started with—all close friends now—all retired. Now I have a new crew of young girls and they're wonderful," she said.

"The same goes for the academics over the years—the renewal of energy in the department has been great."

Maycher says when she isn't at her desk, she loves getting out and exploring the campus, bringing company when she can. "It clears my head and I get energy for the rest of the day."

She says she especially likes getting out during those early days in September.

"I always want to say happy New Year to everybody," said Maycher. "I love the energy the students bring me, and I think I bring them energy in return. It's great."

Shipper delivers duet with The Boss

Michael Brown

"Take it, Bruce."

And with that, Steve Alexander, a shipper/receiver with Supply Management Services, passed the mike back over to rock 'n' roll giant Bruce Springsteen to put the finishing touches on the American icon's amped-up version of *Santa Claus Is Coming to Town*—and on Alexander's dream come true.

The tale begins just before Springsteen's Nov. 26 concert at a sold-out Rogers Arena in Vancouver. Alexander and supply management cohort Phil Webb, both in town for the concert, plotted out a plan to join Springsteen and his E Street Band on stage.

"I know that at this time of year he always plays *Santa Claus Is Coming to Town,*" said Alexander, who has now seen "The Boss" 19 times since 1978. "I figured if we positioned ourselves just right, my buddy dressed like an elf and me with a Santa suit on and a sign, something might happen."

Supplied

Steve Alexander rocks the mike with The Boss.

And it did. Using their floor seats to make their way to the front and waving a hand-painted sign that read "Santa Claus is coming to town and we want to sing it with you. Merry Xmas E Street Band," the duo caught Springsteen's eye.

It's all kind of a blur, says Alexander, who watches the YouTube postings of the moment and still can't believe it.

"He just pointed at me and said, 'Let's go up and sing Santa,'" said Alexander, who made a good account of himself onstage lyrically if not tonally, and kept up the energy level associated with the band's legendary three-hour performances, dancing and embracing Springsteen like a childhood pal at a high-school reunion. "I've seen everybody, and nobody puts on a show like Springsteen."

Exploring the reach of the indigenous Twitterverse

Bev Betkowski

University of Alberta student Kirsten Lindquist spends a lot of time online and along the way, has come to realize the power of the tweet.

Serving as president of the Native Studies Students Association and as editorial assistant for the U of A-based journal *Aboriginal Policy Studies,* Lindquist has evolved from simply posting information online to communicating through social media, particularly Twitter.

"It reached a level where people were asking questions and tweeting back."

That interaction led Lindquist, an undergraduate student in the Faculty of Native Studies, to launch an honours project that explores the reach of Twitter for indigenous communities.

"I became intrigued with how social media can be used in academic studies."

Titled *Indigenous Twibes in 140 Characters or Less,* Lindquist's research project is following five prominent indigenous intellectuals who share information through Twitter, their blogs or other open sources, and who also actively promote Twitter accounts on their own websites, through university faculty sites and by retweeting.

"I want to monitor how we interact in terms of learning and find out how students and the indigenous community at large can engage and influence academia," said Lindquist. "It is about trying to tie together the Twitterverse with the physical spaces and pedagogical spaces of universities and classrooms, and saying to intellectual leaders, here's how we can put it to use in the real world."

Her Twitter project explores how social media could be used to draw indigenous community members into the dialogue of university classrooms. "If we aren't involving the community, how can we call it indigenous studies?"

Over two months, Lindquist is collecting data on hash tags, mentions, number of tweets, followers, following and retweets, to analyze content themes, discussion topics and frequency of participation in Twitter conversations.

Lindquist also plans to review existing academic studies and Canadian census statistics on the topics of indigenous academic leadership, pedagogies and use of social media.

Part of that research will be to find out how extensively indigenous communities have Internet access, and how they are using it.

Lindquist graduated from the U of A in 2008 with a commerce degree, and after working in the marketing field for a few years, decided to return to school, this time drawn to the native studies program. Of Métis descent, Lindquist, who grew up in the Elk Point area of northern Alberta, wanted to explore career goals "more connected to my heritage."

The Faculty of Native Studies, with its rich offerings of research opportunities for undergrads, has opened new doors for her, said Lindquist.

"It has shown me the possibility of extending my education to graduate studies or PhD studies. I had never seen myself continuing in academia and now I see myself doing that."

Lindquist is also grateful for the guidance and support offered by professor Nathalie Kermoal on the project. "She has been so encouraging and supportive of this topic."

John Ulan

Kirsten Lindquist is looking at how social media can draw indigenous communities into the dialogue of university classrooms.

Ultimately, Lindquist hopes that by tracking the comings and goings on Twitter, her project can provide some insight that will benefit all involved: indigenous academics, students and communities.

"I'd like to see this contribute to the field of native studies, in rethinking the traditional classroom and how we can engage and recruit more people.

"For indigenous intellectuals, there are opportunities for more engagement and for evaluating whether their current world views and ways of teaching connect with students—or is there something more they can learn?

"At the community level, I hope people feel they can engage in social movement, with others that they didn't think they could talk with. Where indigenous peoples have traditionally been marginalized, it can create new safe spaces where they can be who they are."

news [shorts]

folio presents a sample of some of the stories that recently appeared on the ualberta.ca news page. To read more, go to www.news.ualberta.ca.

The Psychology of a new name

The School Psychology program in Psychological Studies in Education will be changing its name to School and Clinical Child Psychology to best reflect the goals and competencies of the current program in 2013.

EPL benefits from the U of A digital creations

The Edmonton Public Library will be celebrating its centenary in 2013 digitally, thanks in part to a humanities computing graduate class.

The class created an interactive online story map and a web-based game for the library that Edmontonians will be able to use to explore the library's history and engage with its services.

The website, which takes the form of an interactive map of library branches, includes a function for users to upload their personal stories and photos of their neighbourhood branch. The game that goes along with the site involves users achieving levels by matching historical photos to certain events in the EPL's past.

The humanities computing students came up with the idea, designed the website and game and developed the project from start to finish, all the way from conceptualizing to designing the look and feel of the project to putting on a professional presentation for the EPL staff.

Maureen Engel, faculty service officer with the Office of Interdisciplinary Studies and teacher of the class, came up with the idea to have her students create this project. "It was an unbelievable experience to turn students loose and let them follow their creativity," she said.

Next semester, Eleni Stroulia, a professor in the Department of Computing Science, will guide a class that will take those ideas and make them a reality by programming the back-end of the website and game. EPL hopes to launch the project for public access in May 2013.

New iPhone app keeps up the beat

Thanks to a new made-in-Alberta iPhone application—Med-HF—that puts comprehensive medication and side-effects information at the fingertips of Alberta's physicians and pharmacists, more heart failure patients will be feeling better faster.

Med-HF's interactive, step-by-step instructions help clinicians determine the appropriate dosage of medication and the best way to manage complications as they arise, including side-effects to medication, interaction with other medications, and other conditions such as diabetes or other heart diseases. Some 80,000 Albertans are affected by heart failure, which is the inability of the heart to pump enough blood to meet the body's needs.

Traditionally, clinicians have relied on a combination of national guidelines, individual drug instructions and their own experience to ensure patients with heart failure are managed appropriately.

"This user-friendly tool helps clinicians mitigate the adverse effects of the medications to make them as safe as possible for every patient," said Justin Ezekowitz, Heart Failure Working Group co-chair with the Cardiovascular Health & Stroke Strategic Clinical Network of Alberta Health Services, and associate professor of cardiology. "Using a tool like this could improve outcomes because reaching target dose means reduced mortality and less chance of being in hospital."

Arts prof's documentary debuts on CBC Radio

Russell Cobb, a professor in the Department of Modern Languages and Cultural Studies, wrote an hour-long radio documentary that aired Dec. 16 at 11 p.m. as part of the award-winning series *This American Life* on CBC Radio One. Cobb's piece, *Heretics,* is about an evangelical minister who went from being to a mega-preacher to losing everything.

Family care taking toll on workplace

More than 520,000 Canadian workers aged 45 and older have missed at least one day of work per month to provide care for an elderly relative or friend with chronic health issues or disability, said human ecology professor Janet Fast.

Fast is collaborating with researchers from the universities of Manitoba and Guelph, as well as with government and community partners, in leading an extensive project to measure the societal challenges that accompany an aging population. The Research on Aging, Policies, and Practice (RAPP) initiative is exploring several related factors, including quality of life for seniors and the consequences of caregiving on the workplace.

The findings, based on the latest Statistics Canada survey on later-life families, show an enormous loss of productivity to employers and to the economy in general—the equivalent of 157,000 full-time employees annually.

Fast says workers should become familiar with what their workplace policies allow for in terms of caregiving support, and check out what tax credits may be available. Employers with leave and flexible working policies may also have to consider broadening their understanding of flexibility.

RAPP is now exploring how workplace policies can be improved to accommodate caregivers and their individual circumstances.

"This is going to become an increasingly common experience for Canadians," said Fast. "This is already happening in the workplace and it is not too soon to figure out how we are going to cope with it."

Golden Bears name alum as head football coach

Matt Gutsch

John Ulan

Chris Morris, a three-time Grey Cup champion and U of A alumnus, brings a strong work ethic and a track record of athletic and academic success to his new role as head coach of the Golden Bears football program.

Three-time Grey Cup champion and University of Alberta alumnus Chris Morris has been chosen to turn around the Golden Bears football program.

"At the University of Alberta, we expect our coaches to be passionate leaders and educators," stated Ian Reade, director of Athletics. "We expect our coaches to advance the world of sport through student-athlete development, but also through sport development. We believe we have found an individual with the capability to do both."

Morris, originally from Scarborough, Ont., takes over a program that hasn't won a Canada West conference title since 1981, and has missed the playoffs in seven of the past 12 seasons while putting together a record of 38-58 (.395), including 0-8 in 2012.

"Sometimes people overcomplicate success, but what I've found, in every phase of my life, is that success comes down to outworking the people you're in competition with," said Morris. "If this program is going to become the top program in CIS, then as the head coach of this program, I have to outwork every other CIS head coach."

Morris began his football and post-secondary education paths at the University of Toronto, where he received a bachelor of physical and health education (1995), was twice named a CIS all-Canadian and won the J.P. Metras Trophy as the most outstanding down lineman in the country in 1990. Morris played in the East-West Shrine Bowl, normally reserved as a showcase for American university standouts, before getting drafted eighth overall in the 1992 Canadian Football League draft by the Edmonton Eskimos.

Morris made the team as a starter that year and would go on to play 237 games over 15 seasons for the Eskimos, playing in five Grey Cup games and winning three (1993, 2003 and 2005). In 2008, Morris was given a plaque on the Eskimos' Wall of Honour in Commonwealth Stadium.

> "The University of Alberta Golden Bears football team cannot be successful unless the other amateur football organizations in the province and the Edmonton Eskimos are all at the table in a co-ordinated effort to develop football in Edmonton."
>
> Chris Morris

Morris continued with his education, returning to the U of A where he received a bachelor of education degree in 1997. That same year, while still playing in the CFL, Morris began his career as an educator within Edmonton Public Schools. He ascended to principal of Spruce Avenue Junior High in 2009, where he turned around the school's historical Provincial Achievement Test success rate from 50 per cent to close to 90 per cent, the highest in the history of the school. Morris has also been extremely active with Edmonton and area charities and communities, including the Make-A-Wish Foundation, Ronald McDonald House and the Cystic Fibrosis Foundation, since his arrival in 1992.

He has also served as the offensive co-ordinator of the Harry Ainlay Titans football program, helping the Titans to three city championships, two Northern championships and one provincial championship title over the past four seasons.

"One of the most appealing parts of this job is the fact that you're in one of the very limited and select seats in the province that gets to shepherd football," he said.

"The University of Alberta Golden Bears football team cannot be successful unless the other amateur football organizations in the province and the Edmonton Eskimos are all at the table in a co-ordinated effort to develop football in Edmonton.

"There are very few jobs that present the kind of opportunity this job presents, but can you imagine how it could be if all those parts came together, for the good of football in Edmonton, and started moving in the same direction?"

laurels

Alongside scores of alumni and students, five U of A faculty have been named to *Avenue Magazine's* annual Top 40 Under 40 list. **Guillaume Tardif,** associate professor in the Department of Music, was recognized for his work in bringing a free string-quartet concert series to downtown Edmonton, and for arming music students with invaluable business skills.

Hakique Virani, an assistant clinical professor in the Department of Medicine, made the list thanks in part to work during the H1N1 pandemic three years ago, during which he led a small staff that administered vaccines to Aboriginal people throughout Alberta. All told, roughly 75 per cent of First Nations people received the vaccines, triple the provincial average. Virani is also the founder of the Metro City clinic, an inner-city drug addiction treatment facility he founded in 2008 that has treated hundreds of people and removed them from dangerous lifestyles.

Craig Heinke, an associate professor of physics, made the list thanks to his leading research into the nature of neutron stars.

Sean Collins, a sessional instructor in the Alberta School of Business, made the list for his entrepreneurship in event planning. As a marketing student, Collins helped launch the Alberta School of Business International Case Competition program, which sends students to international challenges as far away as Hong Kong.

Finally, **Jerrold Dubyk,** a woodwind techniques instructor in the Department of Music, found his name on the list for furthering Edmonton's jazz scene and acting as a mentor for up-and-coming musicians.

Faith Davis, professor and chair of the Department of Public Health Sciences in the School of Public Health, received an honorary professorship from the Urals Research Center for Radiation Medicine, an organization of the Russian Federation Health Ministry, for her outstanding contributions to research into late effects of chronic radiation exposure and to the development of international collaboration and co-operation in the field of radiation epidemiology.

The book *Recollecting: Lives of Aboriginal Women of the Canadian Northwest and Borderlands,* written by **Patricia McCormack,** professor in the Faculty of Native Studies, and **Sarah Carter,** professor in the Department of History and Classics and the Faculty of Native Studies, has received a number of awards since its release earlier this year. The honours include the Women Writing the West Conference's Willa Literary Award in Scholarly Nonfiction, the Western History Association's Armitage-Jameson Prize, the Canadian Historical Association's Canadian Aboriginal History Book Prize and the Book Publishers Association of Alberta's Scholarly and Academic Book Award.

Bernard Linsky, professor in the Department of Philosophy, received the 20-12 Book Award from the Bertrand Russell Society for *The Evolution of Principia Mathematica: Bertrand Russell's Manuscripts and Notes for the Second Edition.*

Simaan AbouRizk, professor in the Department of Civil and Environmental Engineering, was elected as a member of the National Academy of Construction in recognition of his leadership in construction simulation and productivity research nationwide.

Award-winning trike design has design students cycling high

Michael Davies-Venn

Four University of Alberta students faced a daunting challenge. Could they redesign a $7,000 recumbent tricycle their client says is representative of precision German engineering? The client—an engineer with a lifetime of experience building race cars—also wanted to be surprised.

Their answer, Gran Turismo, is receiving worldwide attention after it won best overall design in the student category at the 16th annual International Bicycle Design Competition in Taiwan.

> "Professors support students even when we don't come up with the greatest idea. In a way they support failure—it's always try and try again."
>
> Andrew Lesniak

Supplied

The sleek lines and technological finesse of the Gran Turismo concept won its creators the best overall design award in the student category at the International Bicycle Design Competition.

The Triciclo Design team—consisting of Paul Czarnietzki, Mina Lee, Justin Chan and Andrew Lesniak—originally developed the concept as a senior industrial design project. They credit their success to an industrial design teaching philosophy that has produced similar remarkable results. As Lesniak puts it, instructors give students adequate time to keep pushing ideas.

"They support students even when we don't come up with the greatest idea. In a way they support failure—it's always try and try again," he said. "I think that's key in developing creativity—having the chance of constructive criticism and lots of opportunities."

Another foundation for the team's success was laid four years ago when their client, mechanical engineering professor Curt Stout, met industrial design professor Cezary Gajewski. The duo then planned a merger of their senior design classes.

"Our grand experiment, never done before in the engineering faculty, created amazing results," said Stout, who offered his HP Velotechnik Scorpion fs recumbent tricycle to the students as inspiration and served as client, sponsor and engineering mentor.

"It's a beautiful piece of functional German engineering, but I thought it would be interesting to see what Cezary's industrial design students could do with it," he said. "Their simple design objective was to conceive a visually exciting trike that is seriously fun to ride and cool, beautiful to behold, incorporates cool technologies, and surprises me. Their design is sublime."

Along with the cool factor, Czarnietzki says the team's design is also safer for the rider.

"We created a rib-cage exoskeleton providing protection during small impacts or collisions. And we included skid plates, so if someone's doing a really sharp turn, they won't roll over," he explained. "Another feature is high-efficiency LED lights that are powered while pedalling."

Stout, who says riding a bicycle is impossible for him because of multiple back surgeries, is making good on a promise he made at the start of this endeavour.

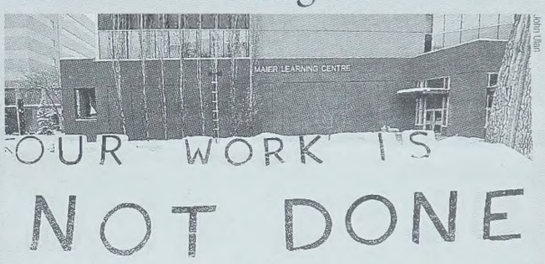
"I promised that if they conceive it, I would make it a reality. And I intend to build their design," he said. "I'm currently finishing a 900-sq.-ft. machine shop to tackle this project," Stout said.

He adds that Gran Turismo exemplifies what results from removing the artificial schism between engineering and art. "My dad was a fighter pilot, artist, musician and trained engineer. I grew up in a household where there was not a dichotomy between art and science; we painted, played music, built race cars and airplanes. I brought this ethos when I started teaching at the university.

"These students have delivered, beating 590 entries from 45 countries and winning a prize that categorically proves their success at this university."

With the win, the team will travel back to Taiwan for a workshop. As well, the students' design is automatically submitted to the Taipei International Cycle Show in March 2013 to compete for a grand prize.

14 not forgotten



A memorial was constructed outside the Maier Learning Centre to remember the 14 women killed Dec. 6, 1989, at the Ecole Polytechnique of Montreal.

talks & events

Talks & Events listings do not accept submissions via fax, mail, email or phone. Please enter events you'd like to appear in folio and at www.news.ualberta.ca/events. A more comprehensive list of events is available online at www.events.ualberta.ca. Deadline: noon one week prior to publication. Entries will be edited for style and length.

UNTIL DEC. 21

Christmas Tree Sales in support of U of A United Way Campaign. Sponsored by the U of A Forestry Society. 9 a.m.–9 p.m. Corbett Hall parking lot.

UNTIL JAN. 5

Perceptions of Promise: Biotechnology, Society and Art. This touring exhibition offers a compelling glimpse into a unique collaboration between scientists, scholars and nine Canadian and international artists working in a variety of mediums. This visually engaging exhibition challenges viewers to consider the positive and negative possibilities of biotechnology in general and stem cell research in particular. Enterprise Square.

UNTIL JAN. 26

U of A Museums present Immortal Beauty. A collaboration between the U of A Museums and the Prince Takamado Japan Centre in the Faculty of Arts, Immortal Beauty celebrates the work of master calligrapher Shikō Kataoka, in the context of calligraphy-inspired works from the University of Alberta Art Collection. Admission by donation. Enterprise Square.

U of A Museums present Passion Project. This U of A Museums exhibition features 75 works from the U of A Art Collection, most of which have not yet been exhibited on campus. Passion Project tells the story of how the university has developed an outstanding art collection, shaped by the personal passion and collective vision of donors, artists, curators and community members. Admission by donation. Enterprise Square.

UNTIL FEB. 15

The Spacious Margin: Eighteenth-Century Printed Books and the Traces of Their Readers. Curated by Sylvia Brown and John Considine, this exhibition explores marginalia found in 18th-century books. Bruce Peel Special Collections Library.

DEC. 25–JAN. 1

Happy holidays. University Closed.

UNTIL JAN. 12

Emergence by Nika Blasser and Stroker by Mackenzy Albright. These exhibits are the final visual presentation for the degree of master of fine arts in Drawing & Intermedia. FAB Gallery.

JAN. 9

Educated Luncheon–Fact or Fiction. The periodical press gave birth to the feminist movement. Women in the 19th century did not have the right to vote, sue or own property. Yet, as a result of the Industrial Revolution, they were participating in the workforce in ever-greater numbers. Feminist ideas and movements began to grow within the educated middle class. Aided by the newspaper and periodical press, a new group of female journalists began exploring women's political challenges through serial writing in newspapers and journals. Susan Hamilton, chair of the Department of English & Film Studies, will consider the impact of this writing on the common reader and how women journalists affected diverse audiences through periodical press. $10 (includes lunch). Noon–1 p.m. Enterprise Square.

classified ads

STUDENT WHISPERERS

photos by **JOHN ULAN, MARKETING AND COMMUNICATIONS**

The Office of the Dean of Students released the hounds, so to speak, on students in an effort to alleviate some of the stress built up studying for final exams. This dog day afternoon, held Dec. 12 in the Centennial Centre for Interdisciplinary Science, was made possible by Chimo Animal Assisted Therapy. Dog-petting stress relievers are being held throughout exams at various locations.